BOOK REVIEWS

An Introduction to the Theory of Plasma Turbulence

V. N. Tsytovich ; Pergamon Press Ltd., 1972 Pp. vii+135 ; £ 3.75.

This updated edition of monograph presents a systematic treatment of the physical principles and theory of plasma turbulence.

In chapter 1, the subject matter includes a discussion on comparison between plasma and liquid turbulence. In chapter 2, the general discussion of some problems of the theory of plasma turbulence have been given. The Balance equation for a turbulent plasma has been described in chapter 3. This includes the quasilinear equations and the wave-particle nonlinear interactions e.g. plasmon-particle interactions. In chapter 4, the Balance equation of the plasma turbulence has been found by statistical averaging. Turbulent broading of the wave-particle Resonance, broading of the wave-wave interactions have been discussed exhaustively. In chapter 5, one finds the spectrum and correlation functions of the Ion-sound turbulence, the anomalous resistivity of the plasma, while in chapter 6, it is dealt with the spectrum and correlation functions of Langmuir turbulence. Stochastic Acceleration of fast plarticles and plasma heating in the case of Langmuir turbulence have been included there. Chapter 7 deals with the Electromagnetic properties of a turbulent plasma while chapter 8 deals with the turbulence in cosmic plasma.

The text can represent the present state of the development of the theory of plasma turbulence. It will be of immense interest to all those involved in research in plasma turbulence, shock waves and in the study of plasma acceleration in astrophysical and cosmic plasma. The detailed nature of the text and the wealth of the material make it useful as a reference book to those working in other branches of plasma physics.

T. P. K

Science & Synthesis

Springer-Verlag, Berlin, 1971 Pp 206.

The book is the report of an international colloquium organised by Unesco on the tenth anniversary of the deaths of Albert Einstein and Teilhard de Chardin and is divided into three parts. The first part is on Einstein and the Scientific synthesis ; the second part contains debates on a number of topics ranging all the way from Cosmology, determinism and indeterminism on the one hand to organization of scientific research on the other. The third part is devoted solely to Teilhard de Chardin.

The participants included many eminent scientists and one finds an account of that old story—how Einstein whose earlier works were marked by a positivist approach and a denial of objective reality neverthless later refused to accept quantum mechanics as a complete theory. In this connection, one finds also a discussion of what constitutes a complete theory and also elucidation of different shades of opinion of the Copenhagen School.

Einstein's later search for a unified theory appeared to most physicists to be a basically fruitless approach (as Oppenheimer frankly stated in his talk) although Heisenberg expressed the view that a unified theory is an absolute necessity if one is to understand elementary particles. However he made the important proviso that it may not be a field theory.

While Einstien's general theory of relativity led to the idea of an evolution on the Cosmological scale in which man or indeed life has hardly any part to play, Teilhard looked upon the Cosmic and biological evolution as parts of one great process whose ultimate result has been the appearance of man. Man was thus to him the most significant phenomenon of nature.

The book will be of interest to those who like to look beyond the frontiers of their own disciplines and try to have a synthesis of the knowledge that man has acquired.

In the index, P 204, there is an unfortunate and serious mistake—S. N. Bose's work leading to the Bose Statistics is attributed erroneously to Sir Jagadis Chander Bose.

A. K. R. C.